



Board of Scientific Counselors

Office of Research and Development
United States Environmental Protection Agency

Communicating Research Results

Final Report of the Ad Hoc Subcommittee
on Communications

September 11, 2003

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NOTICE

This report has been written as part of the activities of the Board of Scientific Counselors (BOSC), a public advisory group that provides objective and independent counsel to the Assistant Administrator for the Office of Research and Development (ORD) of the U.S. Environmental Protection Agency (EPA). The Board is structured to provide a balanced expert assessment of the management and operation of ORD's research programs and its utilization of peer review. This report has not been reviewed for approval by the Agency; and hence, the contents of this report do not necessarily represent the views and policies of the EPA or other agencies in the federal government. Mention of trade names or commercial products does not constitute a recommendation for use.

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PREFACE

The Board of Scientific Counselors (BOSC) provides objective and independent counsel to the Assistant Administrator of the Office of Research and Development (AA/ORD) on the management and operation of ORD's research programs. The primary functions of BOSC are to: (1) evaluate science and engineering research programs, laboratories, and research-management practices of ORD and recommend actions to improve their quality and/or strengthen their relevance to the mission of the EPA; and (2) evaluate and provide advice concerning the use of peer review within ORD to sustain and enhance the quality of science in EPA.

The BOSC Ad Hoc Subcommittee on Communications was formed to examine how effectively the results of research funded by EPA's ORD currently are communicated, both within and beyond the Agency, and how they might be more effectively communicated; and to help ORD more effectively disseminate its research products, explain their significance, and assist others inside and outside the Agency in applying them. The Subcommittee members were Ann Bostrom (BOSC Executive Committee member and Chair of the Subcommittee, Georgia Institute of Technology), Elaine Dorward-King (BOSC Executive Committee member and Co-chair of the Subcommittee, Rio Tinto), Caron Chess (Consultant, Rutgers University), Anna Harding (BOSC Executive Committee member, Oregon State University), and Steven Lewis (Consultant, Exxon-Mobil).

In the BOSC 2001-2002 ORD Laboratory and Center site reviews (conducted as part of the BOSC's second review of the ORD Laboratories and Centers), the following question was posed regarding the communication of research results:

How does (this Laboratory or Center) communicate its results within the organization,

within ORD, within EPA, to outside agencies, and to the outside world?

The Ad Hoc Subcommittee on Communications reached tentative findings based on the Laboratory and Center responses to this question, as reported to the BOSC at its September 23-24, 2002 meeting (see Appendix A), and in the proceedings of the May 15, 2003 workshop (available in Appendix B).

One of the Subcommittee's findings was that the Laboratories and Centers could benefit from sharing some of their best practices with one another. To this end, the Subcommittee proposed that the BOSC hold a best practices workshop on communicating research results, and developed a set of self-study questions regarding innovative communications practices, for the Laboratories and Centers to address at the workshop. Written self-study responses were due to the BOSC prior to the workshop, which took place May 15, 2003, in Washington DC. The specific aims of the workshop were to share and assess best practices with regard to communication of scientific results, and to identify specific opportunities for improvement of EPA/ORD communication of scientific results. The workshop was designed to increase awareness of the importance of communications, increase knowledge of what communication tools there are that could help the Laboratories and Centers, and help them prioritize their efforts to improve. This Subcommittee report was finalized shortly after that workshop and submitted to the BOSC Executive Committee for review and approval. The report also was distributed to ORD management and the Laboratories and Centers to correct any factual errors.

The meeting and self-study responses showed that most of the Laboratories and Centers are doing a good job of establishing effective com-

munication practices, but could still benefit from applying or adapting some of the practices described by other agencies and organizations at the workshop. The ORD Laboratories and Centers demonstrated a laudable increase in their focus on and efforts to communicate research results, and described organizational changes to improve their research results communication efforts, including increases in staff, resources, and communications products.

The report is organized into five sections: (1) Management of Research Results Communications Efforts; (2) Audience Identification and Communications Goals; (3) Formative Evaluation: Designing Communications Programs and Products; (4) Evaluation: Not Just the Numbers; and (5) Risk, Trust, and Strategic Planning. A summary of the recommendations concludes the report.

Acknowledgements

The BOSC gratefully acknowledges the helpful contributions by all presenters at the May 15, 2003, workshop, without which the meeting would have accomplished little. The BOSC extends its thanks to the following EPA and external participants for their presentations and participation: Jack Puzak, Acting Director of the National Center for Environmental Re-

search (NCER); Dr. Hugh McKinnon, Director of the National Risk Management Research Laboratory (NRMRL); Dr. Peter Preuss, Director of the National Center for Environmental Assessment (NCEA); Dr. Gary Foley, Director of the National Exposure Research Laboratory (NERL); Steven Hedtke, Deputy Associate Director for Ecology at the National Health and Environmental Effects Research Laboratory (NHEERL); Dr. Kevin Teichman, Director of the Office of Science Policy (OSP); Dr. Dan Costa, Chief of the Pulmonary Toxicology Branch, NHEERL; Prudence Goforth, Communications Director for the Office of Air and Radiation; Dr. Paul Gilman, Assistant Administrator for Research and Development; Michael Brown, Associate Assistant Administrator for Research and Development; Mike Moore, Director of Communications for ORD; Dr. Marsha Vanderford, Deputy Director of Communication at the National Center for Environmental Health, Centers for Disease Control and Prevention (CDC); Dr. Robert O'Keefe, Vice President of the Health Effects Institute (HEI); Dr. Fred Miller, Vice President for Research at the CIIT Centers for Health Research; Dr. Allen Derry, Associate Director of Research Coordination, Planning, and Translation at the National Institute of Environmental Health Sciences (NIEHS); and Diane Maple, American Lung Association.

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LIST OF ACRONYMS

AA/ORD	Assistant Administrator for the Office of Research and Development
BOSC	Board of Scientific Counselors
CARB	California Air Resources Board
CDC	Centers for Disease Control and Prevention
EPA	Environmental Protection Agency
HEI	Health Effects Institute
NCEA	National Center for Exposure Assessment
NCER	National Center for Environmental Assessment
NERL	National Exposure Research Laboratory
NHEERL	National Health and Environmental Effects Research Laboratory
NIEHS	National Institute of Environmental Health Sciences
NRC	National Research Council
NRMRL	National Risk Management Research Laboratory
OAR	Office of Air and Radiation
ORD	Office of Research and Development
OSP	Office of Science Policy
PM	Particulate Matter
RTP	Research Triangle Park
STAR	Science To Achieve Results
WHO	World Health Organization

1.0 MANAGEMENT OF RESEARCH RESULTS COMMUNICATIONS EFFORTS

Recent approval obtained for ORD to issue its own press releases illustrates the high level of organizational commitment in EPA to improving communication of research results. ORD's ability to develop and send out its own press releases, rather than requiring clearance through a central communication office, is a critical step forward.

The approval for ORD to issue its own press releases marks some decentralization for EPA, which should improve the extent to which research results can be communicated with greater timeliness and effectiveness. The Laboratories and Centers must necessarily engage in public relations efforts as well as in communication of research results. Public relations overlap with communication of research results, and they are important in their own right, as illustrated by the Office of Air and Radiation (OAR) presentation at the May workshop.

Central communications activities in ORD include Office of Science Policy–initiated workshops and products, which are issued centrally from ORD. There also have been new efforts to coordinate communications efforts and provide some central training within ORD, for example, by the Associate Assistant Administrator for Research and Development.

ORD's communications goal, as stated at the workshop, is "to bring about attitudinal and structural changes that support communications, because the Office believes that early communication of research results is essential for the conversion of scientific knowledge to policy decisions and the acceptance of policy decisions." This goal appears to target ORD staff specifically. However, it also includes an implicit more overarching goal of "converting scientific knowledge to policy decisions" (targeting EPA) "and accepting those decisions" (possibly targeting the public). Additional artic-

ulation of ORD-wide communication goals and audiences was not presented at the workshop. If this were done, it would facilitate strategic management and coordination of such communications efforts.

In general, each Laboratory and Center carries out its research results communications efforts largely independently of the others. Decentralization has its advantages, as discussed above, and the committee supports the continued independence of the Laboratories and Centers in this regard. However, these efforts vary on several dimensions, including staffing, organizational structure, and goals. So, for example, the NCER communications staff is 3 to 4 people out of a total staff of around 70. NCEA's communication staff is one individual part time, though NCEA intends to build on this. In most of the Laboratories and Centers, communications staff report directly to top management. The (wide) variety of goals identified by the Laboratories and Centers at the workshop or in the self-study responses are summarized in Table 1.

The workshop illustrated several ways in which increased coordination of and interaction between communications staff across ORD might be beneficial. Strategic development of communication goals is one such area, along with others discussed below. In addition, the discussion of the development of the particulate matter (PM) synthesis report highlighted the potential contributions of vested, rather than contracted, efforts to communicate research results.

Recommendation: ORD should continue its efforts to improve communications practices in all of the Laboratories and Centers. This could include developing a centralized, up-to-date annotated directory of communications expertise within EPA.

Giving communications staff in each Laboratory and Center sufficient time and resources to allow them to assist one another and to exchange ideas in an ORD-wide forum would further good communications practices. Such a forum could even be Internet- or teleconference-based.

Recommendation: The Laboratories and Centers are encouraged to have communications staff report to the Laboratory/Center Director. This ensures that communication receives attention at a management level, and is considered a best practice in industry and academia.

2.0 AUDIENCE IDENTIFICATION AND COMMUNICATIONS GOALS

Audiences identified by the Laboratories and Centers in the self-study or at the workshop are provided in Table 1. Although some of the Laboratories and Centers identified specific audiences for the innovations they highlighted at the workshop, it was evident that the Laboratories and Centers have approached the task of identifying audiences and goals in a variety of ways, with varying results.

As will be discussed under the section on formative evaluation, a more systematic strategic effort to characterize specific audiences and their needs, and to prioritize among them, would likely improve the success of ORD's research results communications efforts. For example, one of the primary audiences for research results from ORD Laboratories and Centers is EPA itself—the Program Offices in

particular, but also Regional Offices. Although Regions were a focal point of some of the presentations at the workshop, not much was said about how the Laboratories and Centers insure that they understand the needs of and are reaching Program Office staff.

Identifying audiences for ORD research results and reaching them more effectively also was a recommendation of the recent National Research Council (NRC) report on the EPA Science To Achieve Results (STAR) program, which is housed in NCER.

Recommendation: The Laboratories and Centers should formally identify the various audiences for their research results and continue their efforts to prioritize among them.

3.0 FORMATIVE EVALUATION: DESIGNING COMMUNICATIONS PROGRAMS AND PRODUCTS

Communicating research results is an integral part of research management. Integrated research management requires planning for results from the outset, including how to communicate the results of that research effectively to those who need them. Early input by end users into research design (e.g., as in NERL's Strategic Customer Value Analyses) is an important component of effective research management, but is not equivalent to involving audiences early in order to improve the design of communications products and programs.

So-called formative evaluation is aimed at developing and improving a program's progress and is analogous to medical testing that takes place before treatment and periodically after initial treatment and diagnosis. Just as test results allow a physician to assess treatment effectiveness or the likelihood thereof, formative evaluation provides managers with feedback during program development and implementation (Posavac, 1991). This kind of evaluation is essential to developing good communication efforts. Formative evaluation can save resources by ensuring that communication reaches those who most need or want it in ways these audiences find useful.

Increasing the effectiveness of communications depends on comprehensive communication planning that involves identifying: (1) key audiences; (2) the interests, needs, and concerns of those audiences; and (3) methods of communicating (workshops, Web sites, newsletters, etc.) that reach those audiences in ways they find useful. Such planning ensures that communication is client-centered. Communication that is merely one-way (e.g., from inside ORD to those outside) is far less likely to be effective than communication that involves asking audiences for input about communication *prior* to the communication effort.

Formative evaluation can assess these key components of communication before communication begins, and on a routine basis. Some examples of formative evaluation include formally or informally getting input from audiences prior to developing a communication effort, pre-testing materials on an intended audience, and soliciting feedback on communication efforts during early phases of implementation. Based on the results of formative evaluation, changes can be made to increase the usefulness and effectiveness of communication.

Because evaluation is too often an afterthought or the result of a crisis, formative evaluation, which must be planned in advance, can be overlooked. Formative evaluation should range in comprehensiveness and rigor based on the importance, scope, and resources expended on the communication program itself. Development of an expensive Web site would merit more rigorous and comprehensive formative evaluation than a one-time publication with limited distribution, unless the publication were critical for a specific reason (e.g., reaching an underserved or politically sensitive audience). Arguably, soliciting limited feedback is better than soliciting none at all. However, anecdotal feedback or feedback based on a limited, non-representative sample will be less generalizable, and, depending on the method, less reliable. On the other hand, measuring results by numbers of people served may not be as important a measure as satisfaction of those served.

The workshop provided examples of communications that involved audience advanced planning and mechanisms for feedback, as well as communication that lacked focus on client needs and was likely to be less effective. Examples of best practices in this regard included the HEI pre-briefings; NIEHS participative research, translational research, and partnerships;

and OAR's use of both formal and informal input to hone its communication efforts. One of the best examples of formative research provided at the workshop was CDC's use of qualitative audience research to provide insights into the values, beliefs, and behaviors of the audiences for the National Report on Human Exposure to Environmental Chemicals. The identification of priority audiences, communication strategy, messages, and materials were based on this formative research. Extensive follow-up research indicated ways to further improve communication for subsequent reports.

Among EPA presentations, a positive example was NCER's efforts to listen to internal and external stakeholders as part of the development of their communication plan. NCER staff worked closely with Regional staff to plan the workshop for Region I in November 2002. Undoubtedly, this interaction led to attracting the number and diversity of participants, positive feedback on written evaluations, and requests from other Regions for similar workshops. NCER also cited intended improvements, such as personal invitations to states, which reflects a useful post-event focus on outreach efforts.

NERL's development of a flow chart to describe its communications efforts reflects a focus on communication planning. However,

the flow chart did not suggest ways in which audience input is used. Collecting input without development of mechanisms to use the input is problematic and suggests limited formative evaluation. NERL highlighted a number of communication innovations, including science-to-science workshops and research abstracts. We suspect that these innovations might be even more effective in the future if input is solicited prior to implementation and at various stages of development.

NRMRL's communication efforts focused on the technology to be used to communicate with its audiences, rather than on getting input from audiences about their informational needs and formatting preferences. NRMRL's current efforts to elicit feedback on these technologically sophisticated products are an important means to save resources and increase effectiveness. NRMRL's evaluation of its pollution prevention workshop also is a step in the right direction. However, getting input from clients prior to such workshops, as NCEA did, is at least as important.

Recommendation: The Laboratories and Centers should increase their use of formal and informal methods of soliciting early input and involvement from their priority audiences to improve their communication of research results.

Reference: Posavac Emil J. and Carey Raymond G. 1991. Program Evaluation: Methods and Case Studies. Prentice Hall.

4.0 EVALUATION: NOT JUST THE NUMBERS

ORD Laboratory and Center communications products and programs have received much positive recognition, including awards such as that from the Society for Technical Communication to NHEERL for its annual report. NCER's Web development has been responsive to, for example, the Region I Science Needs Survey. Several of the Laboratories and Centers did mention evaluation efforts being planned or developed, for which they are to be commended. However, anecdotal feedback was mentioned frequently in response to the question of what performance measures the Laboratory/Center used. Despite the amount of positive feedback reported, there was only sparse indication at the workshop of how this feedback is fed into communications planning and design processes to further improve research results communications.

Outputs and numbers—such as the number of publications, the number of visitors to Web sites, and the number of attendees at workshops—tell only part of the story, and should be used strategically to achieve greatest effect. Analyzing the numbers can go a long way toward making them useful. For example, knowing what proportion of intended attendees that actually show up at workshops may be more useful than having a count of how many show up. Knowing how a few representative users use a Web site may be more useful than knowing how many people used it any given day. For the purposes of analysis and evaluation in particular, it could be helpful to the Laboratories and Centers to have more social scientists involved in their research results communica-

tions efforts, to assist in the analysis of evaluative data.

Outcomes are more difficult to determine, but critical to track. Although the Laboratories and Centers contribute to criteria documents and Agency guidelines, they do not appear to have any formal measure of this contribution. HEI tracks citations in California Air Resource Board (CARB) rulemaking and World Health Organization (WHO) guidelines. ORD could benefit from improved tracking of when and how its research results influence policy.

Recommendation: The Laboratories and Centers should increase their efforts to incorporate the feedback they already collect into their research results communication efforts, and to improve the quality of that feedback. ORD should continue to develop systematic methods of tracking the influence of its research on policy.

It was noted at the workshop that NCEA's bibliography is difficult to use. This contrasts with the automated data passes and flexibility in NCER's Web database code, and with the flexibility and increased usefulness to a wide variety of users implied by the dynamic generation of Web pages from NCEA's Environmental Information Management System (EIMS).

Recommendation: ORD should continue its efforts to standardize and increase the flexibility of access to and use of research bibliographies and databases where possible, in order to facilitate their use.

5.0 RISK, TRUST, AND STRATEGIC PLANNING

Among communications topics that BOSC members raised as potentially neglected at the workshop were risk, trust, and implicitly, strategic planning. When research concerns risk, communicating the results will entail communicating risk. Risk communication is beyond the scope of this report, and is but one of several issues concerning the content and interpretation of ORD communications that deserves further attention.

Trust, on the other hand, may have more to do with organizational structure, practices, and values than with the content of any given communication. For example, HEI is structured to maintain credibility and transparency in what can be controversial national regulatory debates, and does not take policy positions. Although building trust is widely acknowledged as a critical component of a successful communications program, many of the findings that might be useful for ORD regarding how to

achieve this mirror those reviewed in the above discussion on formative evaluation. Knowing one's audience and respecting and addressing its needs consistently are key.

At the outset of its efforts, the Subcommittee intended to follow up on the *NCERQA Communications Strategy and Implementation Plan* of 1998, and hoped to review communications plans for the other Laboratories and Centers. Although said review has not been possible, ORD is to be commended for its progress on communications in the intervening years since the BOSC review of the NCERQA plan in conjunction with the Board's first ORD Laboratory and Center review.

Recommendation: Strategic planning for communication of research results should be integrated explicitly into research management efforts at the Laboratories and Centers.

6.0 SUMMARY OF RECOMMENDATIONS

Management and Staffing: ORD should continue its efforts to improve communications practices in all of the Laboratories and Centers. This could include developing a centralized, up-to-date annotated directory of communications expertise within EPA. Giving communications staff within each Laboratory and Center sufficient time and resources to allow them to provide some assistance to one another and to exchange ideas in an ORD-wide forum would also further good communications practices. Such a forum could even be Internet- or teleconference-based.

The Laboratories and Centers are encouraged to have communications staff report to the Laboratory/Center Director. This ensures that communication receives attention at a management level, and is considered a best practice in industry and academia.

Audience Identification: The Laboratories and Centers should formally identify the audiences for their research results and continue their efforts to prioritize among them.

Formative Evaluation: The Laboratories and Centers should increase use of formal and informal methods of soliciting early input and involvement from their priority audiences, to improve communication of research results.

Incorporating Feedback and Tracking Outcomes: The Laboratories and Centers should increase their efforts to incorporate the feedback they already collect into their research results communication efforts, and to improve the quality of that feedback. ORD should continue to develop systematic methods of tracking the influence of its research on policy.

Standardizing Records: ORD should continue its efforts to standardize and increase the flexibility of access to and use of research bibliographies and databases where possible, to facilitate their use.

Strategic Planning: Strategic planning for communication of research results should be integrated explicitly into research management efforts at the Laboratories and Centers.

Table 1. Communication Goals, Audiences, and Innovations of the ORD Laboratories and Centers

Laboratory or Center	Goals	Audiences	Innovations and Other Communication Strategies Highlighted at May Workshop
National Center for Environmental Research (NCER)	To “target scientific results to address the unique interests and needs of its customers and [relies on feedback] to make these results useful to all of its customers.”	<ul style="list-style-type: none"> ❖ Own organization ❖ EPA Regional Offices ❖ EPA Program Offices ❖ Outside agencies ❖ Professional Societies ❖ “Outside world” of Capital Hill ❖ The scientific community ❖ The public ❖ Specific audiences for specific communications products (e.g., Web site targets NCER project officers and principal investigators, among others) 	<ul style="list-style-type: none"> ❖ <i>Regional Environmental Research Seminars</i> ❖ <i>NCER Web Site—Web-based information describing funded research, including the items listed below .</i> ❖ Publications—Progress and Final research reports, peer-reviewed journal publications, conference proceedings, research “capsules” related to topical areas, STAR reports for lay readers ❖ NCER-sponsored research presentations to EPA staff and to the scientific community ❖ NCER-sponsored progress review workshops ❖ Presentations by NCER-grantees at professional scientific conferences ❖ Future efforts: State of the Science reports, news releases on grant funding and results, one-page summaries of NCER-funded research
National Risk Management Research Laboratory (NRMRL)	To “get the right information in the right format to the people who need it.” To raise awareness, transfer NRMRL research results, and produce high quality peer-reviewed publications.	<ul style="list-style-type: none"> ❖ Technical audiences, including academia, and regulated industries ❖ EPA Regional, state and local government personnel, and Tribes ❖ General audiences/general public 	<ul style="list-style-type: none"> ❖ <i>Multimedia CDs</i> ❖ Technical publications: journal articles, books, and project reports ❖ Technology transfer: synthesis documents, capstone reports, bulletins, workshops, and seminars ❖ Materials for general audiences: brochures, press releases, and public events
National Exposure Research Laboratory (NERL)	<ol style="list-style-type: none"> 1. Raising awareness of NERL’s relevant high-priority research 2. Engaging all NERL staff in the communication effort 	<ul style="list-style-type: none"> ❖ NERL staff ❖ EPA Program and Regional Offices ❖ Decision makers, non-scientific personnel, and the general public 	<ul style="list-style-type: none"> ❖ <i>The Biological Assessment and Criteria (BAC) workshop</i> ❖ <i>Research Abstracts</i> ❖ Strategic Customer Value Analyses, workgroups, meetings and symposia, and other direct communication between the scientists and the regulators ❖ Task reviews

Table 1. Communication Goals, Audiences, and Innovations of the ORD Laboratories and Centers (Continued)

Laboratory or Center	Goals	Audiences	Innovations and Other Communication Strategies Highlighted at May Workshop
NERL (continued)	<ol style="list-style-type: none"> 3. Ensuring that all NERL staff can articulate the work being done at the Laboratory to a variety of audiences 4. Sharing and showcasing NERL's research 5. Informing NERL's staff about NERL communication products. 		<ul style="list-style-type: none"> ❖ Task Information System database, which is an electronic delivery and feedback system to track annual performance goals, delivery of research products to customers, and scientific publications
National Health and Environmental Effects Research Laboratory (NHEERL)	<ol style="list-style-type: none"> 1. To be accurate and innovative in communicating research results to a wide variety of audiences 2. To provide the tools to the scientists so that they are prepared to better communicate their research results 3. To inform decision makers. 	<ul style="list-style-type: none"> ❖ NHEERL ❖ ORD ❖ EPA ❖ Other federal agencies ❖ Congress ❖ The scientific community ❖ Other external audiences (includes the public) 	<ul style="list-style-type: none"> ❖ NHEERL Science Report ❖ NHEERL Annual Report of Accomplishments ❖ Communications program ❖ Communications course for scientists, including emphasis on media relations and fact sheet writing ❖ NHEERL communications desk-top reference ❖ Authoring, co-authoring, or reviewing Program Office guidance documents ❖ Publications in scientific literature and tracking thereof; use of Intra- and Internet Web sites, briefings and fact sheets; brochures and printed products to highlight upcoming/ongoing research in a specific region; and rapid release reports on 'hot' topics for broad audiences.
National Center for Environmental Assessment (NCEA)	<ol style="list-style-type: none"> 1. To inform the public and all stakeholders 2. To tell the complete and fair story. 3. To develop the appropriate communication strategy for each of the key risk assessment efforts, and from the 	<ul style="list-style-type: none"> ❖ ORD ❖ EPA ❖ Environmental decision makers, including the states and the international community <p>More specifically:</p> <ul style="list-style-type: none"> ❖ EPA Regions and programs 	<ul style="list-style-type: none"> ❖ Comprehensive communication plan for rollout of draft cancer guidelines <ul style="list-style-type: none"> – Comprehensive Communication Strategy includes: description of action, background, key messages, audience, expected reactions from stakeholders, detailed communication strategy, announcement notification plan (what, when, who), and contacts

**Table 1. Communication Goals, Audiences, and Innovations of the
ORD Laboratories and Centers (Continued)**

Laboratory or Center	Goals	Audiences	Innovations and Other Communication Strategies Highlighted at May Workshop
NCEA (Continued)	strategy develop useful, readily available, clear, well-written, and timely communication/outreach materials.	<ul style="list-style-type: none"> ❖ State and local pollution control agencies ❖ National, state, and local public health institutions, including state and local environmental and health departments ❖ Health and environmental public interest groups ❖ Industry and regulated community groups ❖ General public ❖ News media ❖ Members of Congress ❖ Executive Branch ❖ SAB members ❖ Academia ❖ Scientific societies (Society of Toxicology, Society for Risk Analysis, etc.) 	<ul style="list-style-type: none"> – Briefing presentations designed for audience (congressional, stakeholders, press) – Public fact sheets (two) – Federal Register Notices – Public Frequently Asked Questions – Headquarters press release – Phone calls – Mailings ❖ Single point person at NCEA responsible ❖ Program and issue-oriented Web pages ❖ Invest in communications and outreach; build staff; listen to internal and external stakeholders; identify Agency needs; work with ORD Laboratories and Centers and EPA Offices; and address BOSC recommendations ❖ Use recognized toolbox of communications materials at EPA ❖ Internet ❖ Coordinate across the Agency (cross-Agency communications group), with other federal agencies, and other parties as appropriate.